

## REMARKS

Claims 33, 41, 43, 47, 49, 53, 55, 59, and 65 have been amended herein.

Claim 34 has been canceled herein. Such cancellation is without prejudice on the merits to further prosecution of the claim in one or more continuing applications.

Claim 33 has been amended in two respects: first, to insert the subject matter of Claim 34; and second, to recite that the charge treatment is applied to the sheets so as to completely saturate the sheets. Verbatim support for his language appears in the specification at page 14, lines 8-10, and at page 16, lines 3-5. On the second point, it is critical to note that the charge treatment is present on each fiber of each sheet. As noted in the passages cited above, the nonwoven web is physically immersed into the charge treatment, thereby saturating the entire porous web with the treatment.

Claims 43, 49, and 55 have been amended solely to insert the word "treatment," which was inadvertently omitted in prior versions of these claims.

Claims 41, 47, 53, 59, and 65 have all been amended to recite that the composition comprises "a plurality," (*i.e.*, two or more) sheets. This was seen as being implied in earlier versions of these claims because each of these claims also requires that the sheets be "multilayered" and needle punched together. Therefore, at least two sheets are needed to arrive at the multilayered construction. These five claims have also been amended to recite that the fibers have an average fiber diameter of from 5 to 30 microns. Verbatim support for this recitation is found in the specification at page 8, lines 14-15.

No new matter is added.

The present Amendment After Final does not present any new issues for search or consideration. Entry of this Amendment After Final is therefore necessary and proper because it directly addresses the issues presented by the Examiner in the Final Office Action and simplifies the issues for appeal should an appeal be required. Entry and consideration on the merits is respectfully requested.

### **Rejection of Claims 41, 47, 53, and 59 Under §112, Second Paragraph:**

The Office couched its rejections under §112, second paragraph as two separate rejections. Because the issues presented by the two rejections are the same, Applicants shall address both rejections simultaneously.

These claims recite the terms "fine-denier" blend fibers and/or "coarse-denier" fibers. The Office has taken the position that these terms are ambiguous. Applicants respectfully traverse this position and point out that the terms are widely used and well understood by the person of ordinary skill in the non-woven fabrics industry. As a general rule of thumb in the industry, the term "micro-denier" fiber (or simply "microfiber") denotes a fiber of about 1 denier or less. As noted by the Office (and agreed upon by the Applicants), the term "fine-denier" fiber denotes a fiber of from about 1.5 to 3.0 denier. A "course-denier" fiber generally refers to any fiber of about 5 denier or larger.

By way of objective evidence of the use of these terms, see Exhibit A, attached hereto and incorporated herein. Exhibit A is a very small collection of representative trade usages of the terms "microfiber," "fine denier fabrics," and "course denier." The first two pages of Exhibit A were taken from the web site of "FiberSource," a publication produced by the American Fiber Manufacturers Association and the Fiber Economics Bureau. This excerpt notes that "microfibers" are "extremely fine filaments (less than 1 denier)."

The third page of Exhibit A is an excerpt from the web site of a commercial fiber supplier, Nantong Luoloai Chemical Fiber Co. Here, the product being described is a mixture of fine denier fibers and "micro fibers." As noted at the bottom of the page, the product contains fibers ranging from 0.5 denier to 3.0 denier. Similarly, the fourth page of Exhibit A is home page of another commercial fiber supplier, Forever Fiber Corporation (FFC). This page notes that FFC makes "regenerated fine and coarse denier fibers." The last page of Exhibit A is a news article from February of 2002 noting that the year 2001 was a particularly difficult year for the U.S. manufactured fiber industry. As noted in the article "industrial coarse denier nylon and polyester filaments" declined 23.0% and 16.0%, respectively. In short, as evidenced by the representative objective evidence shown in Exhibit A, the terms

"micro-denier," "fine-denier," and "coarse-denier," as used in the present specification and claims, are clearly understood by those skilled in the fiber industry.

Regarding the relationship between denier and fiber diameter, the Examiner is absolutely correct. "Deniers" denotes the weight (in grams) of a 9,000 meter length of fiber, while diameter is simply a length. However, the two units are easily converted when one knows the density of the material from which the fiber is made. For example, fiber-grade polypropylene (one of the materials mentioned at page 8 of the specification) has a density of 0.905 to 0.909 g/cm<sup>3</sup>. (See Exhibit B, which is the entry for "Polypropylene, Fiber Grade" taken from MatWeb.com, a free, publicly-accessible, online database of material property data.) Thus, to convert diameter to denier, simply calculate the volume of 9,000 meters of the fiber having the specified diameter. Assuming, for ease of calculation, that the fiber is circular in cross-section (and thus the fiber is a very tall cylinder), the volume of the fiber equals  $\pi R^2(h)$ , where R is the radius of the fiber, and h is the height of the fiber (in this instance, 9,000 meters). Converting the values to centimeters yields the following variables:

5 to 30 microns (as noted in specification at page 8, line 16) = 0.0005 to 0.0030 cm.

9,000 meters (the length of fiber for measuring denier) = 900,000 cm.

Thus, 900,000 cm of a fiber having diameter of 0.0005 cm, has a volume of **0.177 cm<sup>3</sup>**:

$$\text{Volume} = \pi (0.00025)^2 (900,000) = 0.177 \text{ cm}^3$$

And 900,000 cm of a fiber having diameter of 0.0030 cm, has a volume of **6.362 cm<sup>3</sup>**:

$$\text{Volume} = \pi (0.0015)^2 (900,000) = 6.36 \text{ cm}^3$$

Taking the density of polypropylene as 0.909 g/cm<sup>3</sup> (as noted in Exhibit B) the 5 micron-diameter fiber is **0.16 denier** (0.177 cm<sup>3</sup> x 0.909 g/cm<sup>3</sup>) and the 30 micron-diameter fiber is **5.78 denier** (6.352 cm<sup>3</sup> x 0.909 g/cm<sup>3</sup>).

The analogous calculation for a polyester fiber shows that a 5 micron-diameter polyester fiber is **0.39 denier** (0.177 cm<sup>3</sup> x 1.7 g/cm<sup>3</sup>) and a 30 micron-diameter polyester fiber is **10.80 denier** (6.352 cm<sup>3</sup> x 1.7 g/cm<sup>3</sup>). (Polyester fiber has a density of 1.7 g/cm<sup>3</sup>; see Exhibit C, which is the corresponding excerpt from MatWeb.com.)

It is important to note that the passage at page 8 of the specification **does not** limit the "5 to 30 micron" range only to coarse denier fibers, but rather encompasses **all** of the various types of fibers, from micro-denier to coarse-denier. Note that the passage spanning page 8, lines 7-16 is one long sentence, and the final clause "also preferably having 5 to 30 micron average fiber diameter" applies to all of the previously recited fiber types. This interpretation of the passage at page 8 is the only rational outcome because, as noted by the above calculations, polypropylene fibers having diameters ranging from 5 to 30 microns, have denier values ranging from 0.16 denier (a micro-denier fiber) to 5.78 denier (a coarse-denier fiber). The same fiber made from polyester have denier values ranging from 0.39 denier (a micro-denier fiber) to 10.80 denier (a coarse-denier fiber). Thus, the 5 to 30 micron fiber diameter range is the preferred diameter for all of the fibers contained in the claimed composition, regardless of the denier.

Applicants therefore submit that these two rejections are untenable. Withdrawal of the rejections is respectfully requested.

**Rejection of Claims 33, 35, 37, and 39-40 Under §102(b) Over Dahringer et al., U.S. Patent No. 5,726,107:**

This rejection has been overcome by appropriate amendment to Claim 33. Specifically, the subject matter of Claim 34 has been incorporated into Claim 33 (and Claim 34 has been canceled). Because Claim 34 was not made subject to this rejection, the incorporation of the subject matter of Claim 34 into independent Claim 33 renders Claim 33 free of this rejection. Withdrawal of the rejection is respectfully requested.

**Rejection of Claims 34, 41-43, 45-49, 51-55, 57-61, and 63-65 Under §103(a) Over Dahringer et al., in View of Kahlbaugh et al., U.S. Patent No. 5,364,456:**

As applied to Claim 34, this rejection has been rendered moot by cancellation of the claim.

As applied to the remaining claims, this rejection is believed to have been overcome, in part, by amendment to the claims, and is, in part, respectfully traversed.

This rejection is believed to have been overcome, in part, by amending the claims as noted earlier. Specifically, independent Claims 41, 47, 53, 59, and 65 have been amended to recite that the charge treatment applied to the sheets completely saturates the sheets. This positive limitation is neither taught, nor fairly suggested by the combined teaching of Dahringer et al. and Kahlbaugh et al.

Likewise, independent Claims 41, 47, 53, 59, and 65 have been amended to recite that the average fiber diameter present within the composition falls within a range of from 5 to 30 microns. This explicit limitation is neither taught nor suggested by the combined teaching of the two references. On this point, the Office cites Kahlbaugh et al. solely for its description of a gradient depth filter system. But neither of these two references teach a filter wherein the fibers have an average diameter of from 5 to 30 microns.

Applicants therefore submit that this rejection has been overcome. Withdrawal of the rejection is respectfully requested.

**Rejection of Claims 38 and 44 Under §103(a) Over Dahringer et al., in View of Bond et al., U.S. Patent Publication 2002/0,168,912:**

As applied to Claim 38, this rejection is believed to have been rendered moot by appropriate amendment to the base claim, Claim 33. The subject matter of Claim 34 has been incorporated into Claim 33 (and Claim 34 has been canceled). Claim 34 was not made subject to this rejection. Therefore, by incorporating of the subject matter of Claim 34 into independent Claim 33 (the base claim from which Claim 38 depends), the rejection of Claim 38 has been rendered moot. overcomes this rejection Thus, withdrawal of this rejection as applied to Claim 38 is respectfully requested.

As applied to Claim 44, this rejection is believed to have been overcome by appropriate amendment to the base claim, Claim 41. Specifically, Claim 41 has been amended to recite that the fibers have an average diameter of from 5 to 30 microns. This positive recitation of

the claim is neither disclosed nor suggested by the combined references. Applicants therefore submit that this rejection has been overcome. Withdrawal of the rejection is now requested.

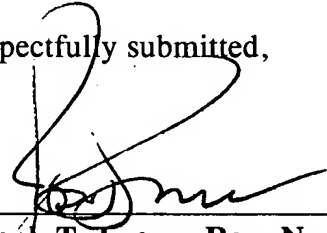
**Rejection of Claims 50, 56, and 62 Under §103(a) Over Dahringer et al., Kahlbaugh et al., and Bond et al.:**

This rejection is believed to have been overcome by appropriate amendment to the base claims, namely Claims 47, 43, and 59. Each of these three claims has been amended to recite that the fibers have an average diameter of from 5 to 30 microns. This positive recitation of the claim is neither disclosed nor suggested by the three-way combination of Dahringer et al., Kahlbaugh et al., and Bond et al. Each reference taken individually is silent on the matter, and therefore the full combination of references is likewise silent on the matter. Applicants therefore submit that this rejection has been overcome. Withdrawal of the rejection is now requested.

**CONCLUSION**

Applicants submit that the application is now in condition for allowance. Early notification of such action is earnestly solicited. The Commissioner is authorized to charge any fees or credit any overpayments relating to this application to deposit account number 18-2055.

Respectfully submitted,

  
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